DOE/RL-2005-67
Rev. 0

Surveillance and Maintenance Plan for the 105-H Reactor Safe Storage Enclosure

United States
Department of Energy

WCH-R & DC mjp 10/27/05

DOE/RL-2005-67
Rev. 0
OU: N/A
TSD: N/A
ERA: N/A

STANDARD APPROVAL PAGE

Title: Surveillance and Maintenance Plan for the 105-H Reactor Safe Storage Enclosure

Author Name: E. G. Ison

Approval: D. E. Reese, Reactor Interim Safe Storage Closure Project Director

D. E. Reese
Signature

10/20/05
Date

D. C. Smith, U.S. Department of Energy, Richland Operations Office

Signature

10/20/05
Date

F. W. Bond, Washington State Department of Ecology

Frederick F. Bond
Signature

10/20/05
Date

The approval signatures on this page indicate that this document has been authorized for information release to the public through appropriate channels. No other forms or signatures are required to document this information release.

DOE/RL-2005-67
Rev. 0

Surveillance and Maintenance Plan for the 105-H Reactor Safe Storage Enclosure

October 2005

United States Department of Energy

P.O. Box 550, Richland, Washington 99352

TABLE OF CONTENTS

Table of Contents

Table of Contents

FIGURES

TABLES

Table of Contents

ACRONYMS

ALARA	as low as reasonably achievable
AOC	area of contamination
ARAR	applicable or relevant and appropriate requirement
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CWC	Central Waste Complex
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DP	distribution panel
DS	disconnect panel
EAP	emergency action plan
ETF	Effluent Treatment Facility
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
HEPA	high-efficiency particulate air
ISS	interim safe storage
RCRA	*Resource Conservation and Recovery Act of 1976*
S&M	surveillance and maintenance
SSE	safe storage enclosure
SSWMI	site-specific waste management instruction
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
VAC	volts alternating current
WCH	Washington Closure Hanford

METRIC CONVERSION CHART

Into Metric Units			Out of Metric Units		
If You Know	*Multiply By*	*To Get*	*If You Know*	*Multiply By*	*To Get*
Length			**Length**		
Inches	25.4	millimeters	millimeters	0.039	inches
Inches	2.54	centimeters	centimeters	0.394	inches
Feet	0.305	meters	meters	3.281	feet
Yards	0.914	meters	meters	1.094	yards
Miles	1.609	kilometers	kilometers	0.621	miles
Area			**Area**		
sq. inches	6.452	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.093	sq. meters	sq. meters	10.76	sq. feet
sq. yards	0.836	sq. meters	sq. meters	1.196	sq. yards
sq. miles	2.6	sq. kilometers	sq. kilometers	0.4	sq. miles
Acres	0.405	hectares	hectares	2.47	acres
Mass (weight)			**Mass (weight)**		
Ounces	28.35	grams	grams	0.035	ounces
Pounds	0.454	kilograms	kilograms	2.205	pounds
Ton	0.907	metric ton	metric ton	1.102	ton
Volume			**Volume**		
Teaspoons	5	milliliters	milliliters	0.033	fluid ounces
Tablespoons	15	milliliters	liters	2.1	pints
fluid ounces	30	milliliters	liters	1.057	quarts
Cups	0.24	liters	liters	0.264	gallons
Pints	0.47	liters	cubic meters	35.315	cubic feet
Quarts	0.95	liters	cubic meters	1.308	cubic yards
Gallons	3.8	liters			
cubic feet	0.028	cubic meters			
cubic yards	0.765	cubic meters			
Temperature			**Temperature**		
Fahrenheit	subtract 32, then multiply by 5/9	celsius	Celsius	multiply by 9/5, then add 32	Fahrenheit
Radioactivity			**Radioactivity**		
picocuries	37	millibecquerel	millibecquerels	0.027	picocuries

1.0 INTRODUCTION

This document provides the plan for implementing surveillance and maintenance (S&M) activities to ensure that the safe storage enclosure (SSE) at the Hanford Site's H Reactor is maintained in a safe, environmentally secure, and cost-effective manner until subsequent closure during the final disposition phase of decommissioning. This plan has been prepared in accordance with guidelines provided in the U.S. Department of Energy's (DOE's) Office of Environmental Management *Decommissioning Resource Manual* (DOE 1995) and Section 8.6 of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989). Specific objectives of the S&M program are as follows:

- To ensure adequate confinement of hazardous substances within the structure
- To provide physical safety and security controls
- To provide periodic inspection to verify the structural integrity of the facility and identify potential hazards
- To maintain the facility in a manner that will minimize potential hazards to the public and the workers
- To maintain the operability of installed equipment and facilitate periodic surveillance and required maintenance
- To provide continuous monitoring of key functions within the facility and periodic data up-link capabilities
- To provide a mechanism for the identification and compliance with applicable environmental, safety and health, and safeguard and security requirements.

2.0 FACILITY DESCRIPTION

This section provides a description of the 105-H Reactor facility and describes S&M activities.

2.1 FACILITY HISTORY

In 1942, the U.S. Government commissioned the Hanford Site for the production of plutonium for weapons use. Between 1942 and 1955, eight water-cooled, graphite-moderated production reactors were constructed along the Columbia River in the 100 Areas of the Hanford Site. Construction of the H Reactor was initiated in 1948, and initial startup of the reactor was achieved on October 29, 1949.

The H Reactor was shut down in April 1965. Until the start of the interim safe storage (ISS) project, the H Reactor had been in a condition of minimum S&M. Permanent decommissioning alternatives for the Hanford Site production reactors were assessed in the *Final Environmental Impact Statement – Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington* (DOE-RL 1992). The preferred alternative in the record of decision (EPA et al. 1993) is safe storage, followed by deferred one-piece removal.

2.2 105-H INTERIM SAFE STORAGE PROJECT

The 105-H Interim Safe Storage (ISS) project was developed to implement the necessary modifications to the 105-H Reactor facility to ensure that the reactor is safely stored until the reactor block is removed at the end of the storage period. The scope of the project included removing the fuel storage basin, ancillary support buildings, and all portions of the 105-H Building structure outside of the shield walls that surrounded the reactor. Steel siding was installed on the upper portions of the building exterior. A new steel roof was installed over the remaining structure using the existing shield walls (constructed with 0.9- to 1.5-m [3 to 4.9-ft]-thick reinforced concrete) as the "new" outside walls of the building to enclose the reactor within a weather-protected structure (refer to the construction drawings listed in Section 10.0 of this plan). Penetrations into the shield walls were closed to prevent animal and insect intrusion and water in-leakage into the final safe storage structure. Accessible loose contamination within the shield walls was either removed or fixed to the greatest extent possible. A remote monitoring system and permanent power and lighting were installed, as well as a provision for ventilation air exchange if required to support S&M activities. Three separate entryways allow access for periodic inspection of portions of the facility.

The reactor block is located near the center of the building. The reactor consists of a graphite-moderated pile enclosed in a cast-iron thermal shield, a biological shield consisting of alternating layers of Masonite®, and steel on the four sides and top. The entire block (14 by 14 by 12.2 m [46 by 46 by 40 ft]) rests on a massive concrete foundation.

2.3 SURVEILLANCE AND MAINTENANCE

The primary activity for 105-H SSE is periodic facility surveillance to ensure structural integrity of the facility and that any hazardous material within the confinement is maintained. The planned surveillance routes are shown in Figures 2-1 through 2-8. Surveillance requirements are defined in WCH-FS-01, Vol. 1, *Field Support Administration*, Procedure 3.1, "Scheduled Maintenance." Field work instructions are defined in WCH-FS-02, Vol. 1, *Field Support Work Instructions*. The Washington Closure Hanford (WCH) Field Support group provides routine maintenance, when required. Maintenance activities are implemented in accordance with the *ERC Maintenance Implementation Plan* (BHI 2000).

The 105-H SSE was designed to be a minimal maintenance facility. A provision for periodic surveillances of the accessible internal areas of the SSE at 5-year intervals has been included to verify facility status. The surveillance frequency may later be adjusted, based on actual inspection history. Nonroutine activities may include necessary repair work on installed monitoring equipment or the facility.

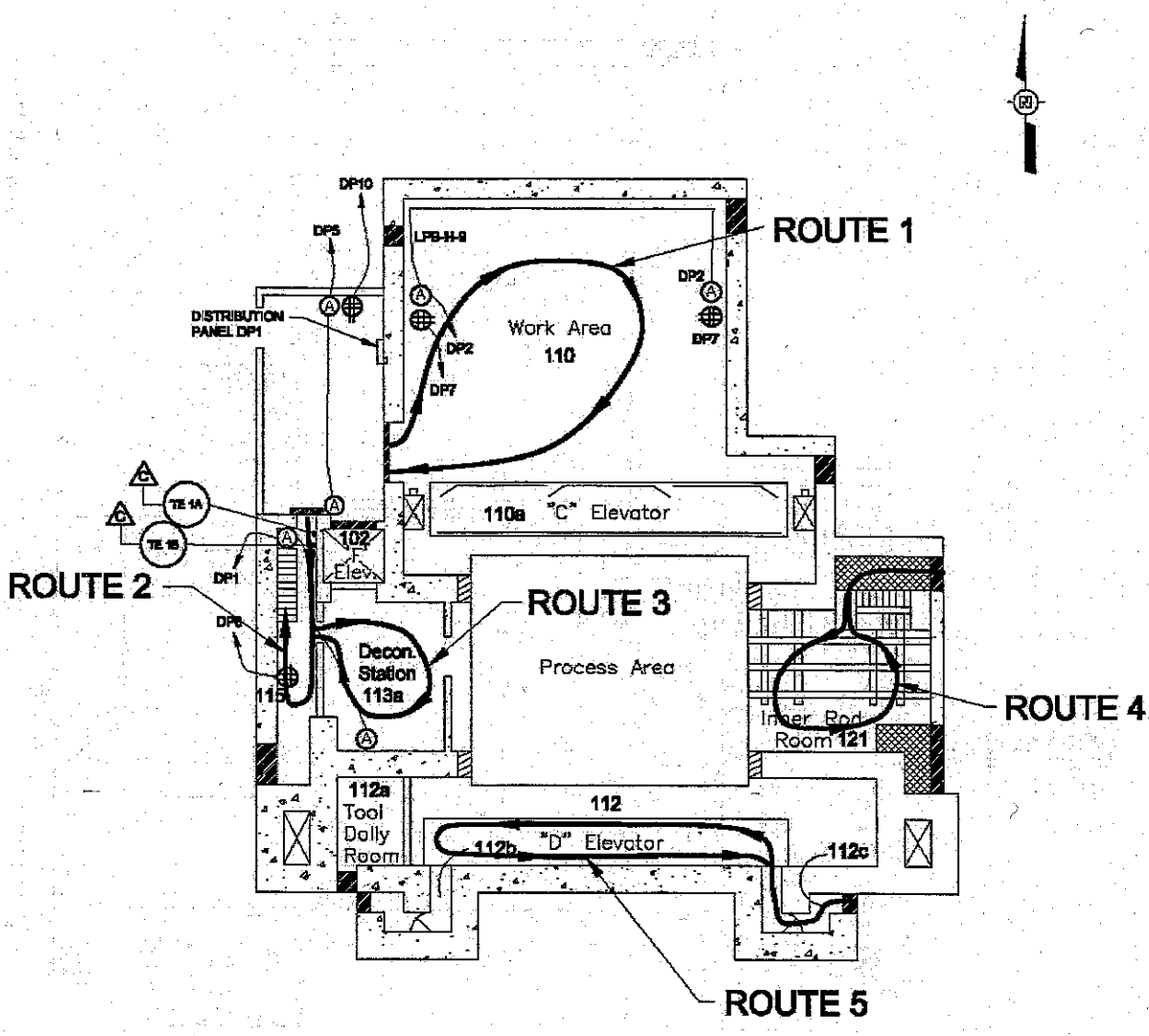
Access to the existing building roofs is not part of the normal surveillance and inspection route. Prior to accessing any existing roof area within the SSE, requirements for fall protection evaluation and authorization must be met. The existing building roofs over the "C" and "D" elevator machinery rooms have open holes used for equipment removal, and access shall require fall protection (see Figure 2-8). The existing building roof over the "front face" room has experienced significant deterioration and should not be accessed (see Figure 2-7). The handrails on the upper-level floor above the "C" and "D" elevator roofs are posted, stating that fall protection is required prior to access to the roofs below. The handrail on the upper-level floor above the front face roof is posted, stating no access to the roof below.

An external visual inspection of the 105-H SSE roof (e.g., roofing, siding, and flashing) and building structure is conducted annually, in accordance with WCH-FS-01, Vol. 1, Procedure 3.1. Access to the roof is not required and should be avoided unless repair is necessary. Visual inspection of the roof can be performed from grade because any potential degradation will be readily apparent (e.g., flashing coming loose).

The 105-H SSE is a deactivated facility and is expected to remain in the S&M program until final decommissioning. Planned S&M activities will include the following areas: structural integrity, barriers and posting, radiological surveys, repair of weather protection systems and structural components, and removal of hazardous substances. These activities are addressed in the following subsections.

® Masonite is a registered trademark of Masonite Corporation, Tampa, Florida.

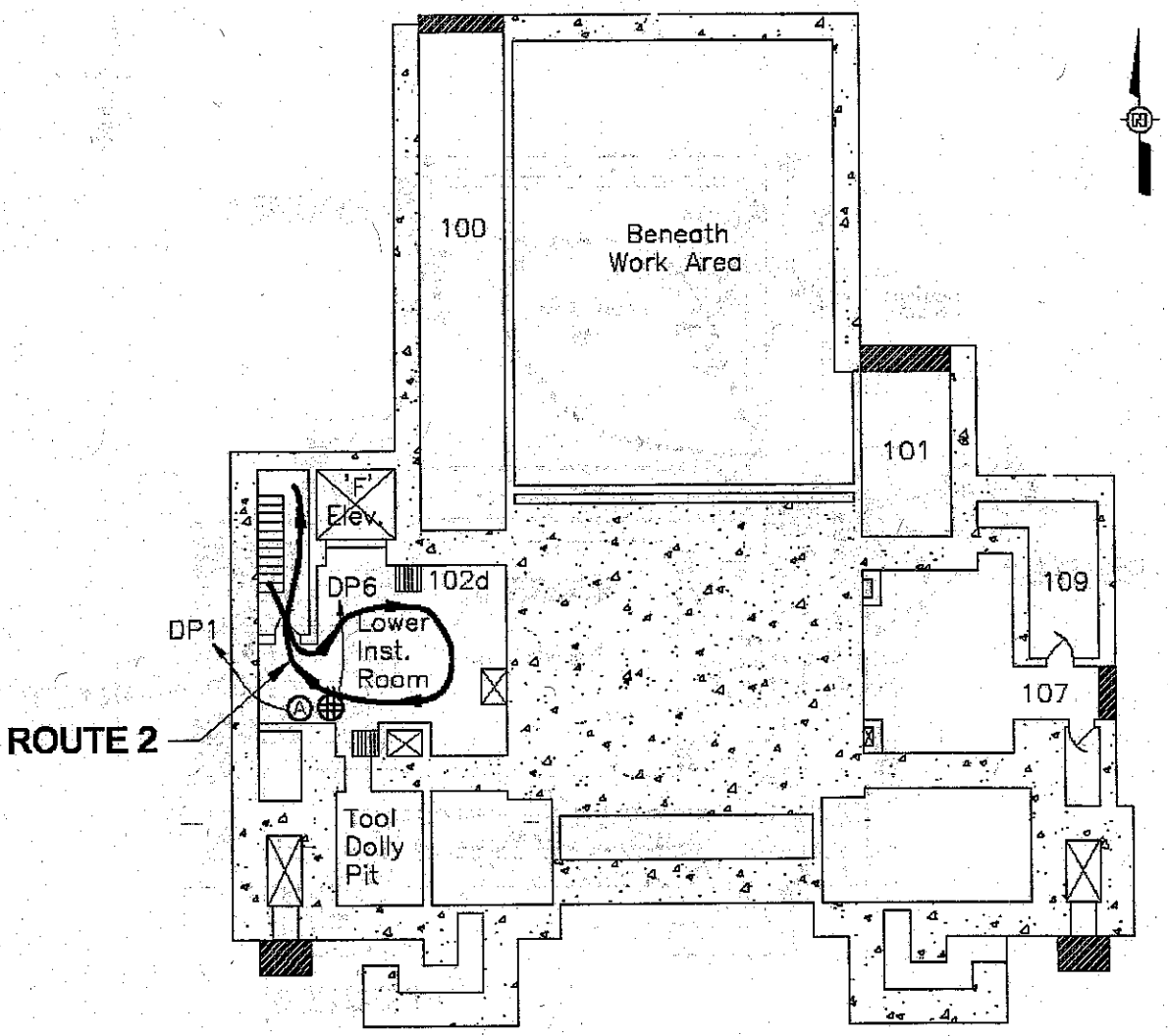
Figure 2-1. Surveillance and Inspection Route (Elevation 0 ft 0 in.).



105 H
GRADE LEVEL
(ELEVATION 0'-0")

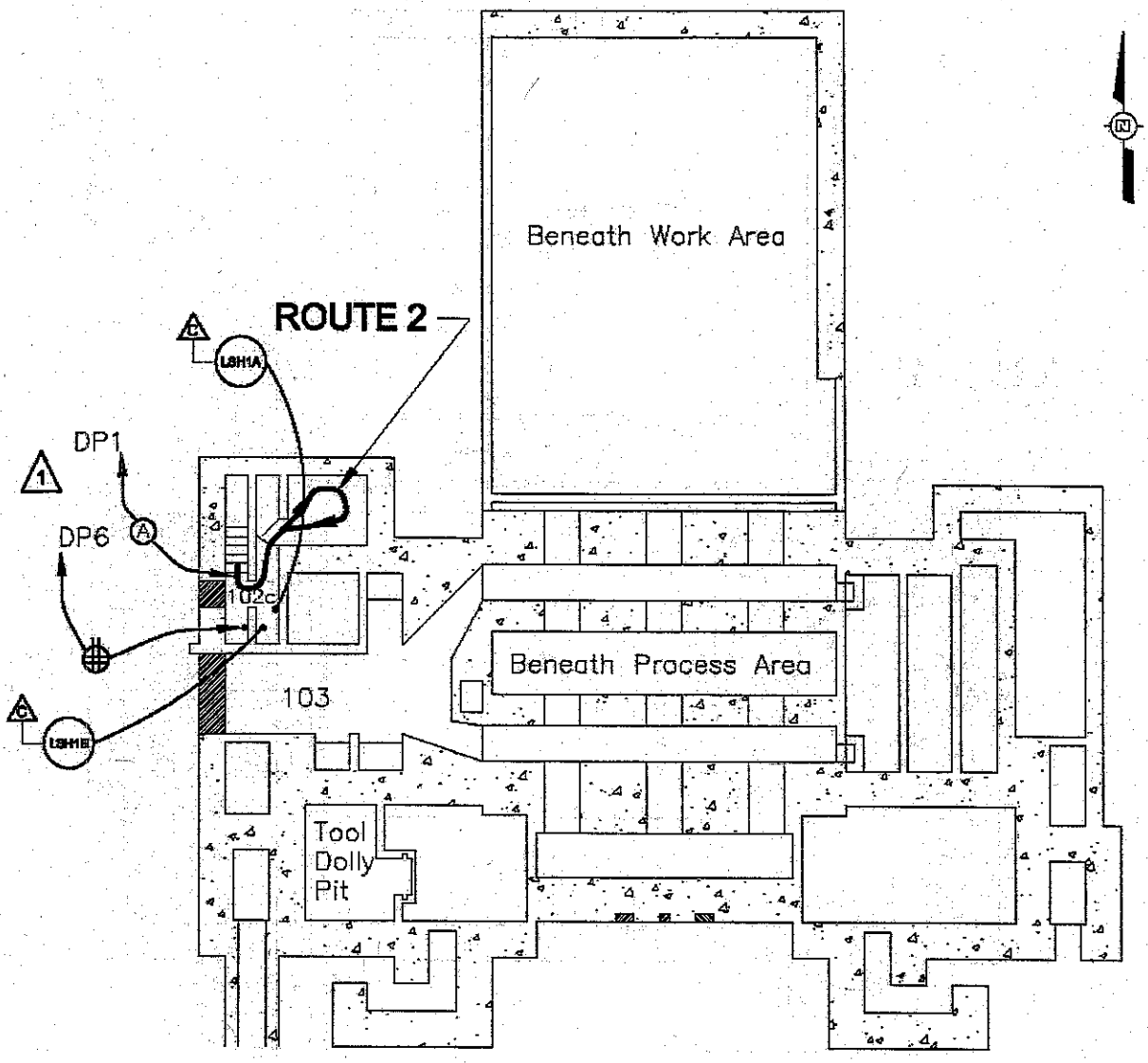
LIGHTING FIXTURE SCHEDULE			
TYPE	DESCRIPTION	REMARKS	SYMBOLS
A	METAL HALIDE FIXTURE, 120V, 175W WALL MOUNT	APPLETON # C-WM-S50H-MT OR APPROVED EQUAL	Ⓐ
	RECEPTACLE, QUADRUPLEX, 120V, 20A		⊕

Figure 2-2. Surveillance and Inspection Route (Below Grade 1).



LIGHTING FIXTURE SCHEDULE			
TYPE	DESCRIPTION	REMARKS	SYMBOLS
A	METAL HALIDE FIXTURE, 120V, 175W WALL MOUNT	APPLETON # G-WM-S70H-MT OR APPROVED EQUAL	Ⓐ
	RECEPTACLE, QUADRUPLEX, 120V, 20A		⊕

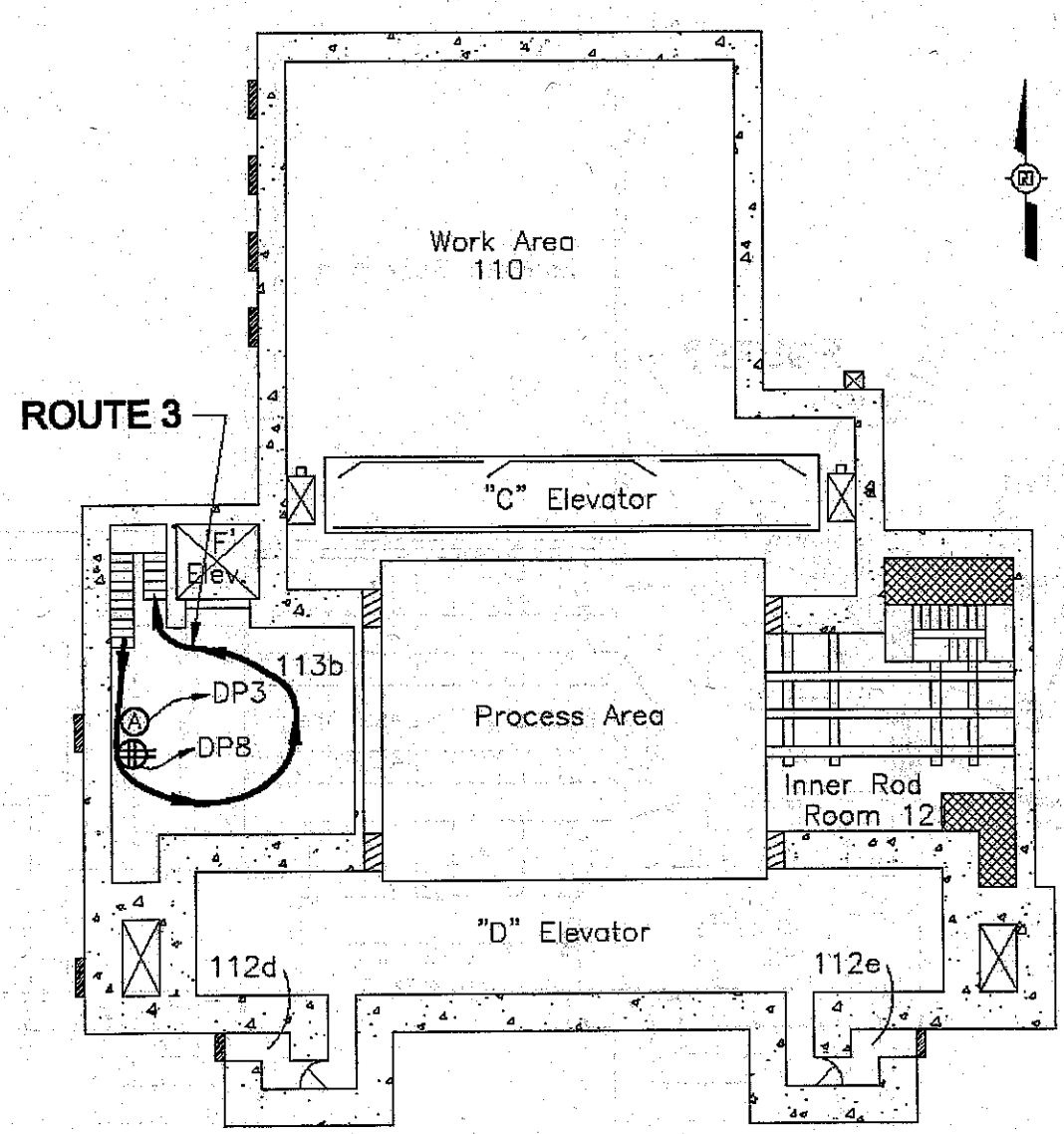
Figure 2-3. Surveillance and Inspection Route (Below Grade 2).



105 H
BELOW GRADE 2

LIGHTING FIXTURE SCHEDULE			
TYPE	DESCRIPTION	REMARKS	SYMBOLS
A	METAL HALIDE FIXTURE, 120V, 175W WALL MOUNT	APPLETON # C-WM-S50-HMT OR APPROVED EQUAL	Ⓐ
	RECEPTACLE, QUADRUPLEX, 120V, 20A		⊕

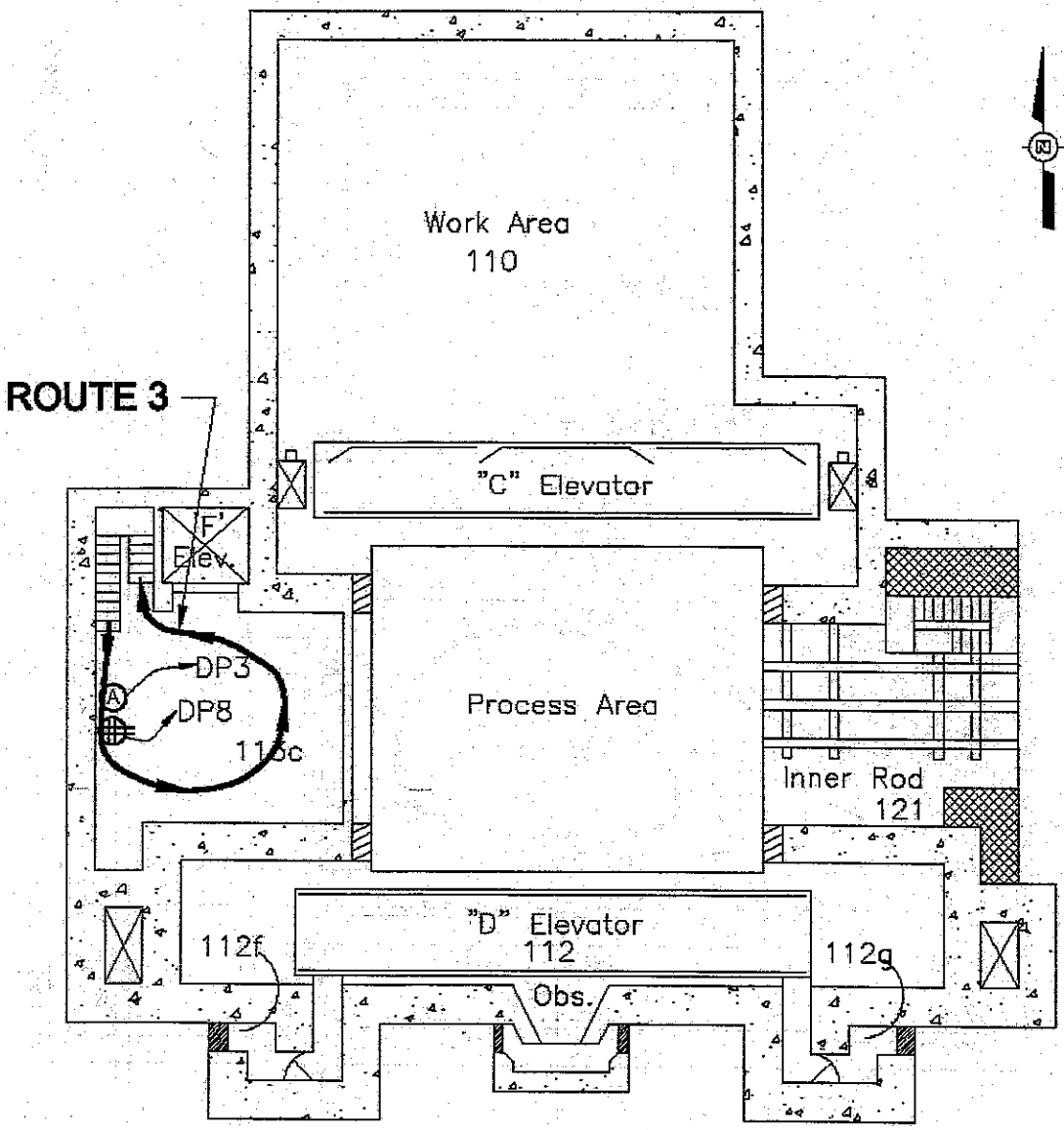
Figure 2-4. Surveillance and Inspection Route (Elevation 12 ft 0 in.).



105 H
ABOVE GRADE 1
(ELEVATION 12'-0")

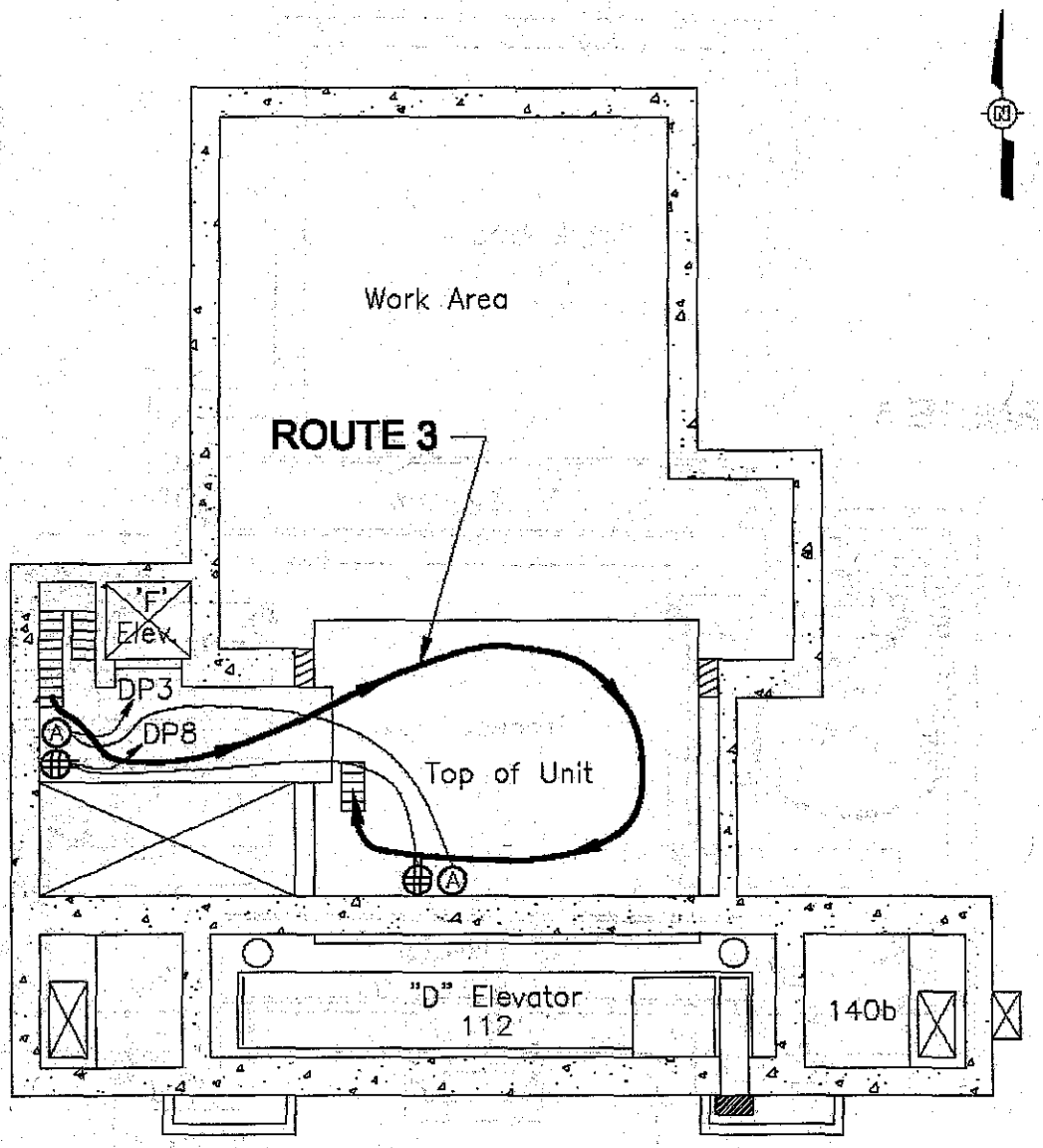
LIGHTING FIXTURE SCHEDULE			
TYPE	DESCRIPTION	REMARKS	SYMBOLS
A	METAL HALIDE FIXTURE, 120V, 175W WALL MOUNT	APPLETON # G-WM-530H-MT OR APPROVED EQUAL	Ⓐ
	RECEPTACLE, QUADRUPLEX, 120V, 20A		⊕

Figure 2-5. Surveillance and Inspection Route (Elevation 23 ft 4 in.).



LIGHTING FIXTURE SCHEDULE			
TYPE	DESCRIPTION	REMARKS	SYMBOLS
A	METAL HALIDE FIXTURE, 120V, 175W WALL MOUNT	APPLETON # G-WM-S30H-MT OR APPROVED EQUAL	Ⓐ
	RECEPTACLE, QUADRUPLEX, 120V, 20A		⊕

Figure 2-6. Surveillance and Inspection Route (Elevation 42 ft 5 in.).



105 H
ABOVE GRADE 3
(ELEVATION42'-5")

LIGHTING FIXTURE SCHEDULE			
TYPE	DESCRIPTION	REMARKS	SYMBOLS
A	METAL HALIDE FIXTURE, 120V, 175W WALL MOUNT	APPLETON # G-WM-S30H-MT OR APPROVED EQUAL	A
	RECEPTACLE, QUADRUPLEX, 120V, 20A		

Figure 2-7. Surveillance and Inspection Route (Elevation 59 ft 4 in.).

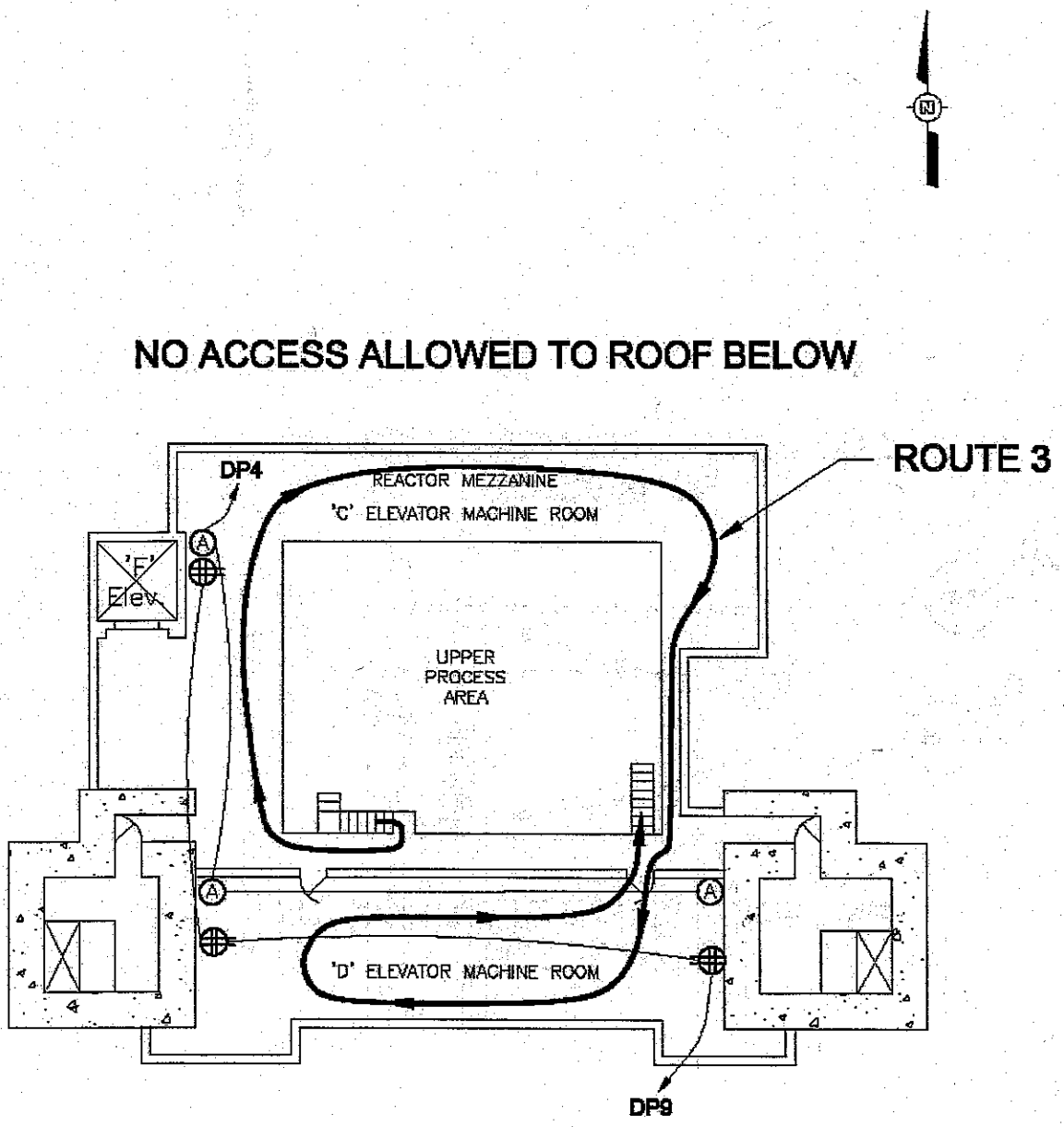
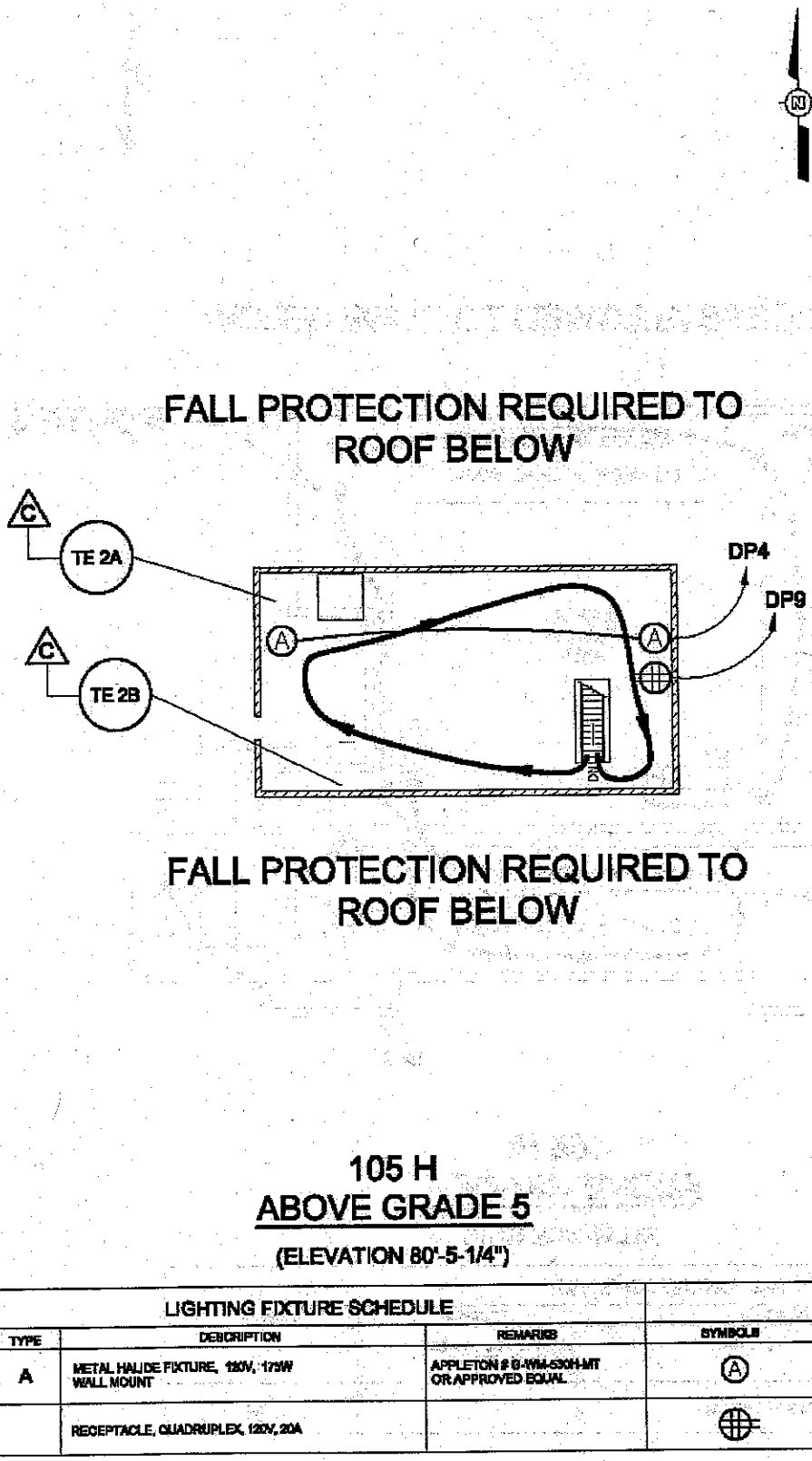


Figure 2-8. Surveillance and Inspection Route (Elevation 80 ft $5^1/_4$ in.).



2.3.1 Structural Integrity

The 105-H facility has been designed to prevent unauthorized access and weather-related damage within the normally anticipated range of conditions. The building and roofing structure will be periodically evaluated for evidence of damage or degradation. The interior of the building will be periodically inspected for evidence of deterioration caused by corrosion, aging of materials, water intrusion, wind damage, and animal and insect intrusion.

2.3.2 Barriers and Postings

Barriers and postings are used to prevent unwarranted access to hazardous areas within the facility, and to inform personnel of conditions that exist at the SSE. Examples could include locks and tags, door locks, fencing, confined space postings, and radiological area postings. Inspection of barriers and postings is conducted as part of the facility's routine surveillance.

2.3.3 Radiological Surveys

In-facility radiological surveys will be conducted upon entry into the SSE facility, in accordance with WCH-RC-04, *Radiological Control Work Instructions*, Instruction 4.2, "Radiological Surveys," to determine radiological conditions. Exterior radiological surveys will be conducted by using a graded approach, in accordance with WCH-RC-04, Instruction 4.2.

Radiological postings and control areas will be updated as necessary to reflect current conditions. Surveys will be documented and used for trending. Significant changes from previous surveys will be evaluated by a competent individual to determine the need for follow-up investigation and corrective actions.

2.3.4 Repair of Weather Protection Systems

Repair of weather protection systems (e.g., sealants, roofing, siding, and flashing) is performed when necessary to confine radioactive material and contamination within the 105-H SSE. Corrective actions will be performed in accordance with established programs and procedures. The repair or upgrade of a confinement system will be evaluated against the existing design.

2.3.5 Repair of Structural Components

Structural components necessary to ensure confinement will be repaired or upgraded to maintain control of confined radioactive material and contamination. Corrective actions will be performed in accordance with established programs and procedures.

2.3.6 Removal of Hazardous Substances

If required, hazardous substances discovered during normal surveillance within the facility will be properly packaged, removed, and disposed at an appropriate disposal facility, in accordance with established procedures.

2.4 SYSTEMS

The following subsections describe the major structures and operation of active systems (refer to construction drawings listed in Section 10.0). A partial parts and equipment list is presented in Table 2-1.

Table 2-1. Partial Parts Listing.

Equipment	Location	Manufacturer	Part Number
Liquid-level switch (total of two) CVI file: 010HD-SC-G0001-09-001	Inside SSE (Below Grade 2)	OMEGA (www.omega.com)	LVN-52
RTD (4)	Inside SSE (0-ft and 80-ft $5^1/_4$-in. elevation)	OMEGA (www.omega.com)	RTD 100Ω PR-18-100-1/8-6-E
RTD converter (total of four) CVI file: 0105H-SC-G0001-09-001	Utility room	Red Lion Controls York, Pennsylvania Phone (717) 767-6511 (www.redlion-controls.com)	Accuracy: ±0.025% Range: -160°C to 654°C (-256°F to 1,209°F) Part #IRMA3035
Programmable logic controller	Utility room	Sixnet (www.sixnetio.com)	"Versa Trak" VT-A2-422-44P
Temperature switch (2)	Utility room	OMEGA (www.omega.com)	SW 143G-2-B
Industrial modem	Utility room	Sixnet (www.sixnetio.com)	VT-MODEM-1US

CVI = certified vendor information
RTD = resistance temperature detector
SSE = safe storage enclosure

2.4.1 Electrical Power

Electrical power for the SSE facility is 120/240-volts alternating current (VAC), one-phase, and is supplied from a 13.8-kV overhead electrical line. From a pole-mounted 13.8-kV/120-V/240-V transformer, the power cables are connected to the main disconnect panel (DS-1) located inside the SSE utility room. DS-1 feeds a distribution panel (DP-1) located inside the SSE utility room. DP-1 provides power for lighting, power receptacles, and the instrumentation system. Backup power capability to these loads is not provided.

The 105-H SSE has permanent lighting installed along the surveillance route located on the lower, grade, upper levels, and the stairwells. In the interest of safety, all facility personnel and visitors must carry a spare light source that can be used for egress if the lighting system should fail during entry.

The 110-VAC receptacles are located at below grade 1 and below grade 2 passages leading to the lower instrument room. Several receptacles are located at the 0-ft level along the surveillance route, and in the SSE access room. Additional receptacles are located on the 12-ft, 23-ft 4-in., 42-ft 5-in., 59-ft 4-in., and 80-ft $5^1/_4$-in. levels.

2.4.2 Instrumentation

The 105-H SSE is configured with two sets of temperature sensors (resistance temperature detectors [Figures 2-1 and 2-8]) and a set of flooding sensors (float switch [Figure 2-3]), which include installed spares for each sensor. Temperature sensors are located at grade level on the west side of the reactor, near the west stairwell. Temperature sensors are also located at the 80-ft $5^1/_4$-in. level near the west wall, and near the center of the attic space. The flooding sensors are located at the west side of the below grade 2 level, near the stairwell.

The remote sensors are controlled through a programmable logic controller powered from DP-1. Signals are transmitted (via wireless modem) and monitored at the operation supervisor's workstation, which is currently located in the 1112-N Building. When an alarm is observed at the remote monitoring station, personnel will evaluate the alarm and, if required, will go to H Reactor and take appropriate corrective actions. Due to the need for changes in the location of the remote monitoring station, the system is portable and can be relocated if required.

A loss of continuity to a resistance temperature detector will result in a loss of signal to the monitoring station. The flooding sensor is normally closed-circuit, so a loss of continuity failure will result in a flooding alarm at the monitoring station. The flooding circuit is directly wired to the programmable logic controller. The temperature-monitoring circuits operate on a 4- to 20-mA current loop from transmitters. The transmitters are supplied with 120-VAC for operating power. In the event of an instrument failure, monitoring for the temperature sensors can be manually switched to previously installed spares from the SSE utility room, eliminating the need to make a special entry into the SSE. Instrument replacements will normally be conducted during regularly scheduled surveillance periods. In addition, the redundant flooding sensors can be electrically switched from the workstation at the 1112-N Building to the backup spare sensor.

2.4.3 Ventilation

The 105-H SSE is a deactivated facility that is uninhabited and locked, except during S&M activities. Many of the reactor's components were removed as part of the stabilization effort for placing the facility into ISS. Remaining equipment and components that contain radiological inventory were sealed during implementation of the ISS project. Many accessible areas in the interior of the building have had a fixative applied to limit the spread of contamination. As such,

no mechanical ventilation of the building is anticipated to be necessary, either during normal storage or during periodic surveillance.

A provision has been made to ventilate the facility with exhaust fans for entry and/or maintenance, if required. The 105-H SSE has been designed for up to 9,000-ft^3/min exhaust for nonroutine building maintenance ventilation. If building exhaust ventilation is required, the interior access door to the SSE shall be placed in the open position. Air is drawn into the SSE through the utility room vents. The size of these openings is sufficient to provide proper flow, even when the exterior door to the SSE utility room is closed.

A ventilation system flow diagram is provided in the *100H Area SSE Ventilation System Flow Diagram* (BHI 2004). The reactor area exhaust air is drawn through flanged galvanized-steel vent openings located on the northeast corner of the SSE. The inner rod room area can be ventilated with a portable exhauster connection in the rod room east doorway. If forced ventilation is required, the ventilation unit will be equipped with high-efficiency particulate air (HEPA) filtration. Before and after swipes of the ventilation unit exhaust port will be taken and counted for gross alpha and gross beta/gamma.

NOTE: To attach the portable exhauster, the sheet metal on the inner rod room curtain wall will need to be breached at the knockout framed in on the north side.

When the portable exhauster is not connected, the connection points are sealed with bolted flanges. Welded stainless-steel security bars are provided behind the bolted flanges in case the flanges were removed maliciously.

2.4.4 Water Systems

All Hanford Site water supply lines to the 105-H SSE have been isolated. All sewer pipes (including floor drains, pipes to trenches, and cribs) have been plugged.

2.4.5 Equipment and Floor Drains

All operations at the H Reactor have been shut down for many years, and liquids have been flushed and drained to the extent possible as part of the shutdown and deactivation process. Liquid pipe checks have been performed at low points of the piping systems to ensure that no liquids remain. Contaminated piping systems (e.g., the gas piping and process effluent piping) remaining in the facility have been sealed as part of the SSE modifications; therefore, liquids should not be encountered during normal surveillance activities.

Floors draining to the pluto crib have been sealed to provide isolation. The pluto crib is to be demolished as a remedial action project in 2007. No sanitary sewer drains are located inside the SSE.

3.0 ENVIRONMENTAL MANAGEMENT AND CONTROLS

Alternatives for conducting a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) non-time-critical removal action at the 105-H Reactor were evaluated in the *Engineering Evaluation/Cost Analysis for the 105-H Reactor Facility and Ancillary Facilities* (DOE-RL 2000a). The engineering evaluation/cost analysis resulted in a recommendation to place the reactor into ISS. The cost estimate for the recommended alternative included S&M activities throughout the ISS period. This recommendation was approved in the *Action Memorandum for the 105-D and 105-H Reactor Buildings and Ancillary Facilities, Hanford Site, Benton County, Washington* (Ecology et al. 2001). The 105-H Reactor was subsequently placed into ISS in 2005, and S&M activities conducted throughout the ISS period will be conducted under CERCLA authority.

A complete list of applicable or relevant and appropriate requirements (ARARs) for this action is identified in DOE-RL (2000a) and the associated action memorandum (Ecology et al. 2001). ARARs germane to S&M activities include waste management standards and standards for controlling releases to the environment. A discussion of how these ARARs will be met for S&M activities is provided in the following subsections.

3.1 WASTE MANAGEMENT

It is not anticipated that S&M activities will involve the generation, handling, or disposition of waste. However, if waste is generated, waste management activities will be performed in accordance with the following ARARs:

- The *Resource Conservation and Recovery Act of 1976* (RCRA), as implemented by 40 CFR 260-268 and WAC 173-303 with respect to management of dangerous waste

- The *Hazardous Materials Transportation Act of 1974*, as implemented by 49 CFR 100-179 with respect to offsite transportation of hazardous materials.

The requirements specified by the ARARs and other applicable guidance will be addressed in a site-specific waste management instruction (SSWMI) prepared in accordance with WCH-EE-10, *Waste Management Plan*. The SSWMI will address designation, waste minimization, packaging, handling, marking and labeling, storage, transportation, and treatment as they specifically apply to waste streams associated with S&M. Wastes that may be generated include the following:

- Solid waste (nonradioactive, nondangerous waste)
- Low-level radioactive waste
- Hazardous and dangerous waste
- Mixed waste (waste that is both low-level radioactive waste and hazardous waste)
- Asbestos waste.

3.1.1 Waste Characterization and Designation

Waste generated will be characterized in accordance with WCH procedures. Characterization will be conducted through process knowledge or sampling/analysis, in accordance with an approved sampling and analysis plan. The waste will be designated, utilizing the gathered characterization data, in accordance with WCH procedures and the Washington State dangerous waste regulations (WAC 173-303).

3.1.2 Waste Minimization

Waste minimization practices will be followed to the extent technically and economically feasible during all phases of waste management. Waste materials will be recycled, reused, or reclaimed, when feasible. Introduction of clean materials into a contamination area and contamination of clean materials will be minimized to the extent practicable. During all phases of waste management, emphasis will be placed on source reduction to eliminate or minimize the volume of wastes that will be generated.

All materials released offsite for disposal/recycle must be certified free of contamination in accordance with WCH material release procedures. Waste materials with no or *de minimis* levels of CERCLA hazardous substance are not considered CERCLA waste and are therefore not subject to the 40 CFR 300.440 offsite acceptability determination.

Some of the waste from S&M activities may contain materials that could be beneficially recycled. As applicable, these materials would be managed/recycled in accordance with WCH excess procedures or the Centralized Consolidated Recycling Center management plan. Recycling of materials permanently removed from the building that contain CERCLA hazardous substances will require an offsite acceptability determination from the U.S. Environmental Protection Agency (EPA), in accordance with 40 CFR 300.440. However, recycling of items generated as a result of routine operational or maintenance activities (e.g., replacement of burned-out light bulbs or discharged batteries from functioning equipment) would not require an offsite acceptability determination per 40 CFR 300.440.

3.1.3 Waste Handling, Storage, and Packaging

CERCLA Section 104(d)(4) states that where two or more noncontiguous facilities are reasonably related on the basis of geography or on the basis of the threat or potential threat to the public health or welfare or the environment, these facilities may be treated as one for the purposes of this section. The preamble to the "National Oil and Hazardous Substances Pollution Contingency Plan" (40 CFR 300) clarifies the stated EPA interpretation that when noncontiguous facilities are reasonably close to one another and wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without obtaining a permit. The 105-H Reactor addressed by this plan and the various disposal/storage facilities located in the 200 Areas (i.e., the Environmental Restoration Disposal Facility [ERDF], the

Central Waste Complex [CWC], and the Effluent Treatment Facility [ETF]) are considered a single site for response purposes under this plan.

The area of contamination (AOC) is defined as the footprint of the remaining structure. The onsite area is defined as all areas outside of the AOC but within the reactor fence line. Any waste management locations outside of the AOC and within the onsite area must meet the substantive requirements of all ARARs. For waste management inside the AOC, safe and effective management practices shall be established to ensure protection of human health and the environment. Substantive provisions of waste management ARARs may be used, when appropriate, within the AOC in this regard. Standards for managing waste within and outside the AOC shall be documented in the SSWMI.

3.1.3.1 Common Waste Handling, Storage, and Packaging Requirements. The requirements in the following paragraphs are common to both the AOC and the onsite area.

Containers or packages of waste requiring tracking (e.g., hazardous or mixed) will be assigned a package identification number by a waste transportation specialist. Containers in poor condition will have the contents transferred to a container in good condition. Portable fire extinguishers and spill-control equipment will be available.

All containers, packages, or items requiring storage in a radioactive materials area will be marked/labeled with radioactive material markings. Storage of all containers (except for containers used to collect fluorescent light tubes) will be closed and secured when not being filled or emptied. Containers will be appropriately labeled and/or marked in accordance with all applicable requirements. Containers will be stored to prevent the accumulation of water.

3.1.3.2 Specific Waste Handling, Storage, and Packaging Requirements. The following specific requirements apply only in the onsite area (outside the AOC) for the variety of wastes that may be generated during S&M activities.

Solid Waste. Solid waste will be managed in accordance with WAC 173-303 and WAC 173-304, with an emphasis on recycling or reuse to the maximum extent possible. Recyclable wastes (i.e., lead, aerosols, and fluorescent light tubes) should be managed in accordance with the management plan for recyclable materials administered by the Hanford Site's Centralized Consolidated Recycling Center. All materials released offsite for disposal, recycle, or salvage must be certified as free of radioactive contamination in accordance WCH material release procedures.

Low-Level Radioactive Waste. Liquids will be collected in appropriate containers. Dependant upon volume and characteristics (i.e., pH, oils, or waste codes), containers may vary from drums to bulk holding tanks. Personal protective equipment may be packaged in bags or drums.

Hazardous/Dangerous Waste. Hazardous/dangerous waste will be packaged and stored to prevent dispersion and public exposures, as required by WAC 173-303. Waste-specific storage and packaging requirements will be described in the SSWMI, as appropriate, to address *Washington Administrative Code* and U.S. Department of Transportation (DOT) requirements.

A minimum 80-cm (30-in.) separation will be maintained between container rows. A row of containers will be no more than two containers wide. Any area storing flammables will be posted with a "NO SMOKING WITHIN 50 FEET" sign. Signs stating "DANGER – UNAUTHORIZED PERSONNEL KEEP OUT" shall be posted at each entrance and along the boundary, as necessary, to be seen from any approach to the storage area.

Mixed Waste. RCRA mixed waste will be managed in compliance with the requirements for both hazardous/dangerous wastes and radioactive waste, in accordance with the SSWMI.

Storage of wastes (nontransuranic) will be allowed at the Hanford Site's CWC.

Asbestos. Multiple forms of asbestos may be encountered. Asbestos-containing materials will be adequately packaged in accordance with appropriate requirements in the "National Emission Standards for Hazardous Air Pollutants" (40 CFR 61), the *Superfund Amendments and Reauthorization Act of 1986*, the Occupational Safety and Health Administration, and the DOT, and will be detailed in the SSWMI.

3.1.4 Waste Transportation and Shipping

All shipments will be conducted in accordance with DOT regulations, 49 CFR 171-179, applicable sections of WAC 173-303, and WCH-EE-12, *ERC Transportation Manual*.

3.1.5 Disposal

All waste resulting from this action will be evaluated to determine if the waste meets the ERDF waste acceptance criteria for disposal (BHI 2003a). Waste stored or disposed at any treatment, storage, or disposal facility, other than those listed in Section 3.1.3, requires EPA approval, in accordance with 40 CFR 300.440.

Solid waste may be sent for offsite disposal at a municipal/industrial landfill. Disposal of materials containing no or *de minimis* levels of CERCLA hazardous substances would not require an offsite acceptability determination per 40 CFR 300.440.

The *Hanford Site Solid Waste Acceptance Criteria* (FH 2002) identifies criteria for acceptance of waste at the CWC. The *Hanford Site Liquid Waste Acceptance Criteria* (WMF 2001) identifies criteria for acceptance of waste at the ETF. The waste acceptance criteria for the ERDF are included in BHI (2003a, 2003b).

3.2 STANDARDS CONTROLLING RELEASES TO THE ENVIRONMENT

Releases to the environment will be managed in accordance with the following ARARs:

- The *Clean Air Act of 1955*, as implemented by 40 CFR 61, with respect to any fugitive air emissions of radionuclides and asbestos.

- The general standards of WAC 173-400-040, with respect to releases of fugitive emissions.
- "Radiation Protection – Air Emissions" (WAC 246-247)
- RCRA, as implemented by the "Dangerous Waste Regulations" (WAC 173-303), with respect to nonroutine releases of dangerous waste/state hazardous substances.

3.2.1 Radioactive Air Emissions

The radioactive emission standards (40 CFR 61, Subpart H, and WAC 246-247) will apply if any radioactive air emissions are generated during S&M activities.

The accessible internal areas of the 105-H SSE have been decontaminated and/or fixative applied, and no forced ventilation will be provided, except as required for special maintenance. Utility building ventilation is available through utility room vent openings (see Section 2.4.3) and is available inside the SSE when the SSE doors are opened. No emissions requiring special monitoring are expected. If forced ventilation is required, the ventilation unit will be equipped with high-efficiency particulate air (HEPA) filtration. Before and after swipes of the ventilation unit exhaust port will be taken and counted for gross alpha and gross beta/gamma.

S&M activities are not expected to result in radioactive fugitive emissions. However, if S&M activities warrant, additional emission controls may be used, including the use of dust suppressants (e.g., water, fixatives, or foam polymers), wiping, and HEPA-filtered vacuums. If HEPA-filtered vacuums are used to control radioactive fugitive emissions, before and after swipes of the vacuum exhaust port will be taken and counted for gross alpha and gross beta/gamma.

The air monitoring plan (DOE-RL 2000b, Appendix B) developed for pre-ISS activities is no longer active, and is being replaced by this document for S&M activities.

3.2.2 Nonradioactive Air Emissions

The general standards of WAC 173-400-040 will apply if S&M activities generate fugitive dust. If S&M activities warrant, the generation of fugitive dust will be controlled through standard industry practices such as the application of water sprays and fixatives, temporary confinement enclosures/glovebag containments that may be HEPA filtered, and HEPA-filtered and/or charcoal-filtered vacuums. These techniques are considered to be reasonable precautions to control fugitive emissions as required by the regulatory standards, and are the same techniques as those applied to control radionuclide air emissions.

If asbestos is encountered, the applicable sections of 40 CFR 61, Subpart M, will be followed.

3.2.3 Reporting Requirements for Nonroutine Releases

The following reporting requirements apply for hazardous substances that could be released during S&M activities.

3.2.3.1 Federal Hazardous Substance. 40 CFR 302, "Designation, Reportable Quantities, and Notification," requires immediate notification to the National Response Center upon discovery of a hazardous substance release into the environment in excess of a reportable quantity.

40 CFR 355, "Emergency Planning and Notification," requires immediate notification to the community emergency coordinator for the local emergency planning committee and to the State Emergency Response Commission for a release of a reportable quantity of an extremely hazardous substance, or a comprehensive release of a reportable quantity of an extremely hazardous substance, or a CERCLA hazardous substance.

3.2.3.2 Dangerous Waste/State Hazardous Substances. WAC 173-303-145 requires immediate notification for any release of a dangerous waste or a state hazardous substance such that human health or the environment is threatened, regardless of the quantity. Notifications must be made to the lead regulatory agency and to local authorities, in accordance with the local emergency plan.

WAC 173-303-360 requires immediate notification to the lead regulatory agency in the event of a release, fire, or explosion at a dangerous waste treatment, storage, and disposal facility, or from a less-than-90-day accumulation area if the event represents an emergency that could threaten human health or the environment. In addition, immediate notification to local authorities is required if the facility emergency coordinator determines that evacuation of local areas may be advisable. A written report on any incident that requires implementation of the facility contingency plan must be submitted to the lead regulatory agency within 15 days, in accordance with WAC 173-303-360(2)(k).

4.0 RADIOLOGICAL CONTROLS

Radiological conditions for facilities within the Deactivation, Decontamination, Decommissioning, and Demolition Closure Project have been assessed to ensure that adequate radiological controls have been implemented to safely perform S&M activities. The radiological control activities implemented for the facilities to demonstrate compliance with 10 CFR 835, "Occupational Radiation Protection," are as follows:

- WCH-RC-01, *Radiation Protection Program Manual*
- WCH-RC-02, *Radiation Protection Procedures*
- WCH-RC-03, *Radiological Control Procedures*
- WCH-RC-04, *Radiological Control Work Instructions*.

Radiological conditions within the SSE will be surveyed as part of the initial entry for surveillance. Based on the results of the radiological survey, a radiological work permit is issued describing the appropriate personnel protective clothing, dosimeter requirements, respiratory protection, and radiological control technician coverage requirements. Prior to performing maintenance activities, the proposed activity is discussed with the Radiological Controls organization to determine the scope of the activity and the radiological survey or protection requirements needed. Technical assessment documentation may be issued by the Radiological Control organization to provide direction for specific survey and/or air sampling requirements. Additionally, an as low as reasonably achievable (ALARA) review may be performed if warranted by the scope of work. The radiological control technicians assess radiological conditions of the work/surveillance area in accordance with WCH procedures, and issue technical assessments, document survey results, and ensure correct radiological postings/boundaries of the area.

The 105-H SSE contains a variety of radiological areas, including the following:

- Radiological buffer areas
- Fixed contamination areas
- Contamination areas
- High contamination areas
- Radiation areas
- High radiation areas.

The areas of the building most frequently entered for S&M activities consist of fixed contamination areas and contamination areas. These areas are surveyed and controlled in accordance with existing WCH procedures and the radiation protection program.

Radiological Controls

If conditions change, the appropriate radiological controls and postings will be implemented in accordance with approved procedures. High radiation areas are posted and locked and will not normally be entered during periodic surveillance, unless conditions warrant (e.g., investigation or special maintenance); special entry requirements will then be implemented. Personnel training and entry requirements into the SSE are outlined in the radiological work permit.

5.0 QUALITY ASSURANCE

The WCH quality program, as documented in WCH-QA-01, *ERC Quality Program,* satisfies the requirements of DOE O 414.1A, *Quality Assurance,* and 10 CFR 830, Subpart A, "Quality Assurance Requirements."

5.1 TRAINING AND QUALIFICATION

Training requirements for WCH personnel performing and/or supporting activities at the 105-H SSE are established in accordance with the WCH training program, as documented in WCH-HR-02, *ERC Training Procedures.*

6.0 HEALTH AND SAFETY/EMERGENCY PREPAREDNESS

6.1 HAZARDS

Hazard analyses are conducted for S&M activities in accordance with the work control process. The team examines available facility data and the proposed activities and processes for hazards, and then develops controls for hazards that may pose a threat to workers, the public, and the environment. WCH-SH-02, Vol. 1, *Safety and Health Procedures*, Procedure 1.7, "Project/ Facility Safety Planning and Documentation," in concert with WCH-FS-01, Vol. 1, Procedure 2.1, "Work Control," ensures that the appropriate level of safety documentation is implemented for all S&M work activities.

6.2 EMERGENCY PREPAREDNESS

Administration (preparedness and planning) of the emergency management program for the 105-H SSE is included in WCH-SH-03, Vol. 4, *Emergency Management Program*. The emergency management program requirements outlined in WCH-SH-03, Vol. 4 meet the requirements of the *Hanford Emergency Response Plan* (DOE-RL 1999), applicable emergency management DOE orders, and state and federal regulations.

If an emergency occurs at the 105-H SSE, the response to mitigate would not be part of S&M; rather, the response would fall under the WCH emergency management program, as outlined in WCH-SH-03, Vol. 4, which implements the applicable DOE emergency implementing procedures.

The following subsections document the emergency management measures employed at the 105-H SSE during S&M.

6.2.1 Emergency Preparedness (Training of Personnel)

The 105-H SSE is locked and unoccupied. The personnel involved in S&M activities make entries into the building during surveillance intervals. Therefore, no permanent emergency equipment, communications equipment, warning systems, personal protective equipment, spill control, or containment supplies are located within the building.

Prior to entry, personnel will review the appropriate procedures and attend pre-job safety meetings. The procedures, emergency action plans (EAPs), and meetings dictate the appropriate emergency equipment to be taken into the work area(s), and will identify the facility-specific hazards and the appropriate evacuation routes and notifications if an incident occurs.

6.2.2 Emergency Planning (Development of the Emergency Action Plan)

An EAP has been written to ensure proper response(s) of employees if an emergency occurs. Facility-specific hazards are outlined in the *Surplus Reactor Auditable Safety Analysis*

(BHI 2005). Primary and alternate building wardens and appropriate evacuation routes are included in the EAP. Employees will review the emergency evacuation plan and the evacuation routes prior to entering the facility to conduct S&M.

6.2.3 Emergency Response (Evacuation)

If an emergency or abnormal incident occurs during S&M activities, personnel will evacuate the facility and communicate the abnormal condition information to the Hanford Patrol Operations Center by dialing "911" (if using a cellular phone, dial 373-3800), to their supervisor, and to the building warden.

6.2.4 Emergency Prevention

Performance of post-deactivation S&M activities and personnel training mitigates contamination migration and/or minimizes the potential for unplanned sudden radiological or hazardous releases.

6.2.5 Incident Response

The initial response to any emergency is to immediately protect the health and safety of individuals in the immediate area, and to initiate a request for emergency response.

7.0 HAZARDOUS SUBSTANCE INVENTORY, MANAGEMENT, AND PROTECTION

The following hazardous substances will be managed in accordance with ALARA considerations and applicable requirements provided in Section 3.0. Compliance with hazardous material protection requirements are ensured, as described in WCH-SH-01, *ERC Safety and Health Program*; WCH-SH-02, Vols. 1 and 4; and WCH-SH-05, *Industrial Hygiene Work Instructions*.

7.1 RADIOLOGICAL MATERIALS

The radioactive materials contained within the reactor block and miscellaneous areas within the SSE are listed in Table 7-1. The radionuclide inventories for the reactor block are taken from the *Radionuclide Inventory and Source Terms for the Production Reactors at Hanford* (UNI 1987). The inventories were decay-corrected to March 1, 1998 in the final hazard classification for the H Reactor (BHI 2005), but credit was not taken for other inventory reduction mechanisms (e.g., release of gases). The majority of radionuclide inventories for other SSE areas was removed during implementation of the 105-H ISS project, but is conservatively calculated in Table 7-1.

Table 7-1. Inventory of Radionuclides Present in the 105-H Safe Storage Enclosure (March 1, 1998). (2 Pages)

Isotope	Reactor Block	Area Within Shield Wall (Excluding Reactor Block)	Inventory (Reactor Block + Area Within SSE)
	Inventory (Ci)	Inventory (Ci)	Total (Ci)
^{3}H	2.65E+03	--	2.65E+03
^{14}C	3.49E+03	--	3.49E+03
^{36}Cl	1.70E+01	--	1.70E+01
^{41}Ca	5.60E+01	--	5.60E+01
^{59}Ni	6.10E+00	--	6.10E+00
^{60}Co	8.37E+02	5.83E-06	8.37E+02
^{63}Ni	7.13E+02	--	7.13E+02
^{90}Sr	7.47E+00	8.22E-05	7.47E+00
^{93}Mo	3.99E-02	--	3.99E-02
^{94}Nb	3.20E-01	--	3.20E-01
^{99}Tc	2.00E-03	--	2.00E-03
^{133}Ba	4.73E+00	--	4.73E+00
^{137}Cs	2.23E+01	3.51E-04	2.23E+01

Table 7-1. Inventory of Radionuclides Present in the 105-H Safe Storage Enclosure (March 1, 1998). (2 Pages)

Isotope	Reactor Block	Area Within Shield Wall (Excluding Reactor Block)	Inventory (Reactor Block + Area Within SSE)
	Inventory (Ci)	Inventory (Ci)	Total (Ci)
^{152}Eu	2.09E+01	3.81E-05	2.09E+01
^{154}Eu	7.27E+00	9.18E-06	7.27E+00
^{239}Pu	1.00E+00	--	1.00E+00
^{241}Am	2.94E-01	--	2.94E-01
Total (Ci)	7.83E+03	--	7.83E+03

-- = insignificant inventory
SSE = safe storage enclosure

7.2 LEAD

The reactor block contains approximately 72,640 kg (160,000 lb) of lead, which is an integral part of reactor shielding. This material is part of the reactor block and will not be encountered during surveillance activities. Lead paint was originally used throughout the facility, and elemental lead may exist in remaining components and as shielding material (e.g., inner rod room wall); the lead from this source is not expected to present a hazard during surveillance activities. The requirements of the lead abatement program will be followed where there is a potential for encountering lead during maintenance activities.

7.3 ASBESTOS

All accessible asbestos was removed to the extent possible during the process of placing the H Reactor into safe storage. Asbestos should not be encountered during surveillance activities. The requirements of the asbestos abatement program will be followed where there is a potential for encountering asbestos during maintenance activities.

7.4 BIOLOGICAL HAZARDS

Although the 105-H SSE was sealed to the greatest extent possible, there is a potential for animal/insect intrusion. The associated hazards may include poisonous snakes, poisonous insects, and disease vectors from rodents or birds. Personnel assigned to perform S&M activities shall receive training on potential hazards and use personal protective equipment, as appropriate.

7.5 CHEMICALS

All of the known hazardous materials (e.g., mercury, polychlorinated biphenyls, and lubricating oils) that were used during reactor operation have been removed, and none of these materials should be encountered during surveillance activities. In the event that unknown materials are discovered during S&M activities, applicable procedures will be used to minimize, characterize, package, and remove the materials.

8.0 SAFEGUARDS AND SECURITY

Section 7.0 contains a summary of the remaining residual radionuclides remaining at the 105-H SSE. Based on the analysis for the inventory of radioactivity (BHI 2005), the form of the radioactive materials, and the energy sources available to act upon the radioactive material, the final hazard classification for the 105-H ISS project is designated as "radiological," in accordance with the *DOE Limited Standard Hazard Baseline Documentation* (DOE 1994).

Access to the Hanford Site is restricted. There are three access ways into the 105-H SSE: (1) main access is through the SSE utility room, (2) inner rod room access is through a door in the east wall, and (3) discharge platform/rear face area access is through a security plate sealing the east labyrinth at grade level. During periods of storage, the door to the utility room will be locked shut, and the inner door to the SSE will be locked and sealed shut with tack welds. The door to the control room will be locked shut, and the inner door to the inner rod room will be locked and sealed shut with tack welds. The discharge platform/rear face area door/security plate will be bolted closed and sealed shut with two closure bolt-nut tack welds. During S&M, the doors to the rooms will be locked shut when the building is unoccupied. Signs are posted accordingly throughout the facility identifying restricted access. The facility is entered only for S&M activities. Access control for 105-H SSE and other surplus facilities is described in WCH-FS-01, Vol. 1, Procedure 1.1, "Access Control and Administration for ERC Facilities."

There are no intrusion alarms or routine security patrols for the 105-H SSE. The Hanford Patrol continues to provide routine security patrols in the vicinity as part of their patrols throughout the 100 Areas.

9.0 COST AND SCHEDULE

The following are January 2002 estimated costs for S&M of the 105-H SSE, based on a 5-year cycle:

Year	Cost
1	$5,000 (includes yearly external radiological survey and minimal tumbleweed removal)
2	$5,000
3	$5,000
4	$5,000
5	$41,000 (includes entry into the SSE for S&M, without the need to implement ventilation of the SSE).

Maintenance and major repair costs are assumed to be zero.

Activities described in Section 2.3 are scheduled throughout the year, in accordance with the applicable fiscal year work plan and the Field Support work package system described in WCH-FS-01, Vol. 1.

Cost and Schedule

10.0 DRAWING LIST

The drawings specified in this section show the as-built configurations for the 105-H SSE.

10.1 STRUCTURAL

Type	Number	Cross-Reference Number	Subject
DWG	0105H-DD-C0003	H-1-88861 SHT01	0105H-DD-T0.00 -SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, TITLE SHEET
DWG	0105H-DD-C0004	H-1-88862 SHT01	0105H-DD-S0.0-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, GENERAL NOTES
DWG	0105H-DD-C0005	H-1-88863 SHT01	0105H-DD-S1.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, FOUNDATION PLAN
DWG	0105H-DD-C0006	H-1-88864 SHT01	0105H-DD-S1.2-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, PLAN AT TOP OF EXISTING STRUCTURE
DWG	0105H-DD-C0007	H-1-88865 SHT01	0105H-DD-S2.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, UPPER LEVEL ROOF FRAMING PLAN
DWG	0105H-DD-C0008	H-1-88866 SHT01	0105H-DD-S2.2-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, LOWER LEVEL ROOF FRAMING PLAN
DWG	0105H-DD-C0009	H-1-88867 SHT01	0105H-DD-S2.3-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, UPPER LEVEL BRACING FRAMING PLAN
DWG	0105H-DD-C0010	H-1-88868 SHT01	0105H-DD-S3.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, EXTERIOR BUILDING ELEVATION
DWG	0105H-DD-C0011	H-1-88869 SHT01	0105H-DD-S3.2-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, EXTERIOR BUILDING ELEVATION
DWG	0105H-DD-C0012	H-1-88870 SHT01	0105H-DD-S3.3-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, EXTERIOR BUILDING ELEVATION
DWG	0105H-DD-C0013	H-1-88871 SHT01	0105H-DD-S3.4-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, EXTERIOR BUILDING ELEVATION
DWG	0105H-DD-C0014	H-1-88872 SHT01	0105H-DD-S3.7-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, 3D EXTERIOR ELEVATIONS
DWG	0105H-DD-C0015	H-1-88873 SHT01	0105H-DD-S3.8-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, 3D EXTERIOR ELEVATIONS
DWG	0105H-DD-C0016	H-1-88874 SHT01	0105H-DD-S4.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0017	H-1-88875 SHT01	0105H-DD-S4.2-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0018	H-1-88876 SHT01	0105H-DD-S4.3-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0019	H-1-88877 SHT01	0105H-DD-S4.4-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0020	H-1-88878 SHT01	0105H-DD-S4.5-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION

Drawing List

Type	Number	Cross-Reference Number	Subject
DWG	0105H-DD-C0021	H-1-88879 SHT01	0105H-DD-S4.6-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0022	H-1-88880 SHT01	0105H-DD-S4.7-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0023	H-1-88881 SHT01	0105H-DD-S4.8-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0024	H-1-88882 SHT01	0105H-DD-S4.9-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0025	H-1-88883 SHT01	0105H-DD-S4.10-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0026	H-1-88884 SHT01	0105H-DD-S4.11-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0027	H-1-88885 SHT01	0105H-DD-S4.12-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0028	H-1-88886 SHT01	0105H-DD-S4.13-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0029	H-1-88887 SHT01	0105H-DD-S4.14-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, STRUCTURAL FRAMING ELEVATION
DWG	0105H-DD-C0030	H-1-88888 SHT01	0105H-DD-S5.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0031	H-1-88889 SHT01	0105H-DD-S5.2-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0032	H-1-88890 SHT01	0105H-DD-S6.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0033	H-1-88891 SHT01	0105H-DD-S6.2-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0034	H-1-88892 SHT01	0105H-DD-S6.3-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0035	H-1-88893 SHT01	0105H-DD-S7.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0036	H-1-88894 SHT01	0105H-DD-S7.2-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0037	H-1-88895 SHT01	0105H-DD-S7.3-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0038	H-1-88896 SHT01	0105H-DD-S7.4-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0039	H-1-88897 SHT01	0105H-DD-S7.5-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0040	H-1-88898 SHT01	0105H-DD-S8.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0041	H-1-88899 SHT01	0105H-DD-S8.2-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0042	H-1-88900 SHT01	0105H-DD-S8.3-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS

Type	Number	Cross-Reference Number	Subject
DWG	0105H-DD-C0043	H-1-88901 SHT01	0105H-DD-S8.4-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0044	H-1-88902 SHT01	0105H-DD-S8.5-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0045	H-1-88903 SHT01	0105H-DD-S9.1-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS
DWG	0105H-DD-C0046	H-1-88904 SHT01	0105H-DD-S5.3-SSE SYSTEM DESIGN DRAWINGS – 105-H AREA, 105-H REACTOR SSE, SECTIONS AND DETAILS

10.2 ELECTRICAL

Type	Number	Cross-Reference Number	Subject
DWG	0105H-DD-E0001	H-1-87598 SHT01	100H AREA SSE PERMANENT POWER & LIGHTING SYSTEM ONE LINE DIAGRAM
DWG	0105H-DD-E0002	H-1-87599 SHT01	100H AREA SSE POWER AND LIGHTING SYSTEM ELECTRICAL ARRANGEMENT (-) GRADE / GRADE LEVEL
DWG	0105H-DD-E0003	H-1-87600 SHT01	100H AREA SSE POWER AND LIGHTING SYSTEM ELECTRICAL ARRANGEMENT @ ABOVE GRADE 1 - 2
DWG	0105H-DD-E0004	H-1-87601 SHT01	100H AREA SSE POWER AND LIGHTING SYSTEM ELECTRICAL ARRANGEMENT @ ABOVE GRADE 3 - 5
DWG	0105H-DD-E0005	H-1-87602 SHT01	100H AREA PERMANENT ELECTRICAL DISTRIBUTION SYSTEM GROUNDING PLANS, ELEVATIONS AND DETAILS
DWG	0105H-DD-E0006	H-1-87603 SHT01	100H AREA PERMANENT ELECTRICAL DISTRIBUTION SYSTEM XFMR AND CUTOUT POLE DETAILS

10.3 INSTRUMENTATION

Type	Number	Cross-Reference Number	Subject
DWG	0105H-DD-E0001	H-1-87598 SHT01	100H AREA SSE PERMANENT POWER & LIGHTING SYSTEM ONE LINE DIAGRAM
DWG	0105H-DD-E0002	H-1-87599 SHT01	100H AREA SSE POWER AND LIGHTING SYSTEM ELECTRICAL ARRANGEMENT (-) GRADE / GRADE LEVEL
DWG	0105H-DD-E0003	H-1-87600 SHT01	100H AREA SSE POWER AND LIGHTING SYSTEM ELECTRICAL ARRANGEMENT @ ABOVE GRADE 1 - 2
DWG	0105H-DD-E0004	H-1-87601 SHT01	100H AREA SSE POWER AND LIGHTING SYSTEM ELECTRICAL ARRANGEMENT @ ABOVE GRADE 3 - 5

Type	Number	Cross-Reference Number	Subject
DWG	0105H-DD-E0005	H-1-87602 SHT01	100H AREA PERMANENT ELECTRICAL DISTRIBUTION SYSTEM GROUNDING PLANS, ELEVATIONS AND DETAILS
DWG	0105H-DD-E0006	H-1-87603 SHT01	100H AREA PERMANENT ELECTRICAL DISTRIBUTION SYSTEM XFMR AND CUTOUT POLE DETAILS

10.4 MECHANICAL

Type	Number	Cross-Reference Number	Subject
DWG	0105H-DD-M0004	H-1-87614 SHT01	100H AREA SSE VENTILATION SYSTEM FLOW DIAGRAM

11.0 REFERENCES

10 CFR 830, "Nuclear Safety Management," Subpart A, "Quality Assurance Requirements," *Code of Federal Regulations*, as amended.

10 CFR 835, "Occupational Radiation Protection," *Code of Federal Regulations*, as amended.

40 CFR 61, "National Emission Standards for Hazardous Air Pollutants," *Code of Federal Regulations*, as amended.

40 CFR 260-268, "Protection of Environment," *Code of Federal Regulations*, as amended.

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations,* as amended.

40 CFR 302, "Designation, Reportable Quantities, and Notification," *Code of Federal Regulations*, as amended.

40 CFR 355, "Emergency Planning and Notification," *Code of Federal Regulations*, as amended.

49 CFR 100-179, "Transportation," *Code of Federal Regulations,* as amended.

BHI, 2000, *ERC Maintenance Implementation Plan*, BHI-01044, Rev. 2, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2003a, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, BHI-00139, Rev. 4, including Change Notice BHI-00139-04-CN-01, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2003b, *Supplemental Waste Acceptance Criteria for Bulk Shipments to the Environmental Restoration Disposal Facility*, 0000X-DC-W0001, Rev. 6, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2004, *100H Area SSE Ventilation System Flow Diagram*, Drawing No. 0105H-DD-M0004, Rev. 0, Bechtel Hanford, Inc., Richland, Washington.

BHI, 2005, *Surplus Reactor Auditable Safety Analysis*, BHI-01172, Rev. 4, Bechtel Hanford, Inc., Richland, Washington.

Clean Air Act of 1955, 42 U.S.C. 7401, et seq.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601, et seq.

References

DOE, 1994, *DOE Limited Standard Hazard Baseline Documentation,* DOE-EM-STD-5502-94, August 1994, U.S. Department of Energy, Washington, D.C.

DOE, 1995, *Decommissioning Resource Manual*, DOE/EM-0246, U.S. Department of Energy, Office of Environmental Management, Washington, D.C.

DOE O 414.1A, *Quality Assurance*, U.S. Department of Energy, Washington, D.C.

DOE-RL, 1992, *Final Environmental Impact Statement – Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington*, DOE/EIS-0119F, December 1992, U.S. Department of Energy, Washington, D.C.

DOE-RL, 1999, *Hanford Emergency Response Plan*, DOE/RL-94-02, Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2000a, *Engineering Evaluation/Cost Analysis for the 105-H Reactor Facility and Ancillary Facilities*, DOE/RL-2000-46, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2000b, *Removal Action Work Plan for 105-D and 105-H Building Interim Safe Storage Projects and Ancillary Buildings*, DOE/RL-2000-57, Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

Ecology, EPA, and DOE, 2001, *Action Memorandum for the 105-D and 105-H Reactor Buildings and Ancillary Facilities, Hanford Site, Benton County, Washington*, January 5, 2001, Washington State Department of Ecology, U.S. Environmental Protection Agency Region X, and U.S. Department of Energy, Richland, Washington.

EPA, Ecology, and DOE, 1993, *Record of Decision, Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington*, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington.

FH, 2002, *Hanford Site Solid Waste Acceptance Criteria*, HNF-EP-0063, Rev. 12, Fluor Hanford, Inc., Richland, Washington.

Hazardous Materials Transportation Act of 1974, 49 U.S.C. 1801-1819, et seq.

Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq.

Superfund Amendments and Reauthorization Act of 1986, 42 U.S.C. 11001, et seq.

References

UNI, 1987, *Radionuclide Inventory and Source Terms for the Production Reactors at Hanford*, UNI-3714, Rev. 1, United Nuclear Industries, Inc., Richland, Washington.

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, as amended.

WAC 173-304, "Minimum Functional Standards for Solid Waste Handling," *Washington Administrative Code*, as amended.

WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, as amended.

WAC 246-247, "Radiation Protection – Air Emissions," *Washington Administrative Code*, as amended.

WCH-EE-10, *Waste Management Plan*, Bechtel Hanford, Inc., Richland, Washington.

WCH-EE-12, *ERC Transportation Manual*, Bechtel Hanford, Inc., Richland, Washington.

WCH-FS-01, Vol. 1, *Field Support Administration*, Bechtel Hanford, Inc., Richland, Washington.

WCH-FS-02, Vol. 1, *Field Support Work Instructions*, Bechtel Hanford, Inc., Richland, Washington.

WCH-HR-02, *ERC Training Procedures*, Bechtel Hanford, Inc., Richland, Washington.

WCH-QA-01, *ERC Quality Program*, Bechtel Hanford, Inc., Richland, Washington.

WCH-RC-01, *Radiation Protection Program Manual*, Bechtel Hanford, Inc., Richland, Washington.

WCH-RC-02, *Radiation Protection Procedures*, Bechtel Hanford, Inc., Richland, Washington.

WCH-RC-03, *Radiological Control Procedures*, Bechtel Hanford, Inc., Richland, Washington.

WCH-RC-04, *Radiological Control Work Instructions*, Bechtel Hanford, Inc., Richland, Washington.

WCH-SH-01, *ERC Safety and Health Program*, Bechtel Hanford, Inc., Richland, Washington.

WCH-SH-02, Vols. 1 and 4, *Safety and Health Procedures*, Bechtel Hanford, Inc., Richland, Washington.

WCH-SH-03, Vol. 4, *Emergency Management Program*, Bechtel Hanford, Inc., Richland, Washington.

References

WCH-SH-05, *Industrial Hygiene Work Instructions*, Bechtel Hanford, Inc., Richland, Washington.

WMF, 2001, *Hanford Site Liquid Waste Acceptance Criteria*, HNF-3172, Rev. 0, Waste Management Federal Services of Hanford, Inc., Richland, Washington.

DISTRIBUTION

U.S. Department of Energy
Richland Operations Office

K. D. Bazzell	A3-04
B. A. Biro	A5-19
D. C. Smith	A3-04
J. J. Waring	L1-02
A. K. Wright	L1-02

Washington Closure Hanford

S. E. Dieterle	L1-04
D. W. Eckert	X7-75
D. W. Edwards	L1-04
R. G. Egge	X5-50
J. C. Fulton	L1-04
G. J. Gibbons	X5-50
J. W. Golden	L1-04
E. S. Hatfield	L1-04
R. R. Nielson	X5-50
D. E. Reese	X5-50
P. K. Wells	X5-50
100 Area D4/RISS Project Files (2)	X5-50

Records and Document Control (2)	H0-30
Hanford Technical Library	P8-55
DOE-RL Public Reading Room	H2-53

Distribution